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ABSTRACT

In 1983, the Washington State Legislature passed a bill providing incentive loans for students to become mathematics and science teachers. This report describes the employment status of loan recipients who completed teacher preparation programs as of November, 1987. Responses to the survey questionnaire from 199 teachers provided answers to the following questions: (1) What differences exist between those who teach full time and those who do not? (2) What types of teaching positions are held by those respondents who teach full time? (3) Among respondents who do not teach full time, what differences occur between those who work in related technical fields and those who teach part time? and (4) How extensively did loan recipients apply for teaching positions? A brief analysis is presented of the responses to each of these questions. (JD)

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FOLLOW-UP STUDY OF RECIPIENTS OF INCENTIVE LOANS FOR MATHEMATICS AND SCIENCE TEACHERS

Report to Financial Aid Office
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FOLLOW-UP STUDY OF RECIPIENTS OF INCENTIVE LOANS FOR MATHEMATICS AND SCIENCE TEACHERS

In 1983 the Washington State Legislature passed a bill providing incentive loans for students to become mathematics and science teachers. This action was a response to previous research by Olstad and Beal (1981) that indicated an impending shortage of mathematics and science teachers in Washington state. Further funding resulted from legislative action in 1985 and 1987.

PURPOSE

The purpose of this report is to describe the employment status of loan recipients who completed teacher preparation programs as of November 1987. This is the fourth in a series of reports regarding the implementation and effectiveness of the loan program. In 1986 two reports were finished. The first, "The Use of Incentive Programs for Mathematics and Science Teachers in the Fifty States and the District of Columbia," indicated that even though about half of the states in the United States had similar incentive loan programs, only two other states had conducted evaluation studies of their programs. The second report, "Implementation of the Incentive Program for Mathematics and Science Teachers in Washington State," showed that the loan program was in place, but that there were differences among institutions of higher learning regarding the conditions for granting of loans. In 1987, a report, "Effectiveness of the Incentive Loan Program for Mathematics and Science Teaching in Washington State 1983-1986," provided

information from a survey of students who had received loans up to the fall of 1986.

This teacher placement follow-up study reports two major findings:

1. Only about one-half of those people who received loans and completed the program are teaching mathematics and/or science full time, and only three-fourths of those teach in public secondary schools in Washington state. In other words, only 37.5 percent of the loan recipients are eligible for loan forgiveness.

2. Even though the numbers of women and men prepared to teach mathematics and science were almost equal, the number of men hired was significantly higher than the number of women hired as full-time teachers.

In this report, the incentive loan recipients who had completed a teacher preparation program in Washington state were surveyed to provide answers to the following questions:

1. What differences exist between those who teach full time and those who do not?
2. What types of teaching positions are held by those respondents who teach full time?
3. What differences occur among those who do not teach full time?
4. How extensively did loan recipients apply for teaching positions?

Information was gathered regarding respondents' age, ethnicity, gender, geographic areas in which applications were filed, subjects available to teach, extracurricular school activities available to lead, current

employment, and--if respondent teaches full time--the subjects taught and extracurricular duties assigned.

PROCEDURE

Surveys were designed and mailed by the Financial Aid Office of the Higher Education Coordinating Board, which administers the "Mathematics and Science Teacher Incentive Loan Program." Their handling of the mailing ensured students' anonymity. Surveys were sent to the 253 students who had completed teacher preparation programs in science and/or mathematics and had received loans.

FINDINGS

Of the 253 loan recipients who had completed their programs, 199 responded; this was a 79 percent return. Of the 96 recipients who are teaching in mathematics/science full time in Washington state public schools, 78 percent responded to the survey. Of the 127 who are repaying their loans, 90 percent returned the survey. The lowest level of response was from students whose loan payments are deferred; 40 percent replied (see Table 1).

Table 1
Loan Status by Percent Responding

Status in Program	Number Responding	Percent Responding
Loan Forgiven (N=96)	75	78
Loan Deferred (N=30)	12	40
Repaying Loan (N=127)	112	90
Total Mailed (N=253)	199	79

Loan is forgiven when recipient teaches full time and teaches some mathematics or science in a Washington state public school

Fifty-seven percent of the survey responses came from people in loan repayment status, 6 percent from students whose loan payments are deferred, and 37 percent from individuals who meet the requirements for loan forgiveness.

For purposes of this report, all respondents who are teaching full time were grouped together. This includes anyone teaching mathematics and/or science, and those teaching other subjects whether elementary or secondary.

1. WHAT DIFFERENCES EXIST BETWEEN THOSE WHO TEACH FULL TIME AND THOSE WHO DO NOT (see Table 2)

Age: For the total group of respondents who teach full time, 21 percent were between the ages of 20 and 24, 52 percent were between 25 and 34, and 27 percent were 35 years or older. Of those who do not teach full time, 19 percent were between ages 20 and 24, 57 percent between 25 and 34, and 23 percent were older than 34.

Ethnicity: Ninety-three percent of the respondents who teach full time were White, 5 percent were Native Americans, and 2 percent were Asians. All of the Asians (2) and half of the Native Americans (5) teach full time. Of those who do not teach full time, 92 percent were White, 5 percent were Native Americans, and 3 percent did not indicate their ethnicity.

Gender: No significant difference existed between the number of men and women that responded--106 men (53 percent) and 93 women (47 percent). However, the percentage of responding men hired to teach full time was significantly higher ($p < .05$) than the percentage of responding women. Sixty-three percent of those who teach full time are men, while only 37 percent are women. Of those who do not teach full time, 44 percent are men and 55 percent are women.

Table 2
Comparison Between Those Who Teach Full Time
and Those Who Do Not

Variable	Percent of Respondents who Teach Full Time N = 94	Percent of Respondents who do NOT Teach Full Time N = 105
Age		
20-24	21	19
25-34	52	57
35+	27	23
Ethnicity***		
White	93	92
Native American	5	5
Asian	2	0
Others*	0	0
Not indicated	0	3
Gender**		
Women	37	56
Men	63	44
Extracurricular Responsibility**		
Willing to Coach	63	32
Not Willing to Coach but Would Direct Other Activity	3	33
No Response	34	35

* Group includes people who teach part time, substitute, work in related technical fields, have other positions, or are unemployed.

** Significant difference: $p = .05$.

*** No Blacks or Hispanics responded to the survey.

Extracurricular School Activity: Of all respondents, 47 percent said they would coach, 18 percent named other activities, and 35 percent did not respond. Of those who teach full time, 63 percent stated they could coach, 3 percent listed other clubs, and 34 percent did not respond. Of those who do not teach full time, 32 percent could coach, 33 percent listed other clubs, and 25 percent did not respond.

2. WHAT TYPES OF TEACHING POSITIONS ARE HELD BY THOSE RESPONDENTS WHO TEACH FULL TIME?

Of the 94 who reported that they are full-time teachers, 11 teach in grades K-6, 25 in middle schools or junior high, and 43 in high schools. Fifteen people indicated that their teaching contracts included grades 7-12.

Seventy-five of the loan recipients who teach full time are in Washington state public schools and are eligible for forgiveness. Seven people teach in private schools and 13 teach outside Washington state--these must repay their loans.

The main subjects taught are mathematics (66 percent) and biology (32 percent). Twenty-four percent taught some chemistry; 17 percent, general science; 14 percent, physics; and 14 percent, earth science. It is obvious that most respondents teach multiple subjects and have multiple preparations. Of the 94 people teaching full time, 21 teach mathematics full time and 4 teach biology full time.

Coaching was the principal extracurricular activity. Of those hired to teach, 63 percent were willing to teach and coach. However, only 36 percent hold coaching positions as part of their contract; men hold 77 percent of those positions. Twenty-seven percent of those teaching full time advise other clubs; women hold 67 percent of these positions. The remaining 37 percent of the full-time teachers reported that they do not have extracurricular school responsibilities.

3. WHAT DIFFERENCES OCCUR AMONG THOSE WHO DO NOT TEACH FULL TIME (See Table 3)

Comparison among the sub-sets of those who do not teach full time showed two statistically significant items. First, significantly more people who took work in related technical fields were between the ages of 25 and 34. Second, significantly more women work as part-time teachers or substitutes.

Those people who took positions in related technical fields applied in fewer geographical areas. The average number of applicants per area was 0.31; that is, about one person in every three of this group applied for any teaching position. People in this group had the lowest level of response to questions regarding their willingness to lead extracurricular school activities (89% not responding).

Table 3
Description of Respondents Who Do Not Teach Full Time
N = 105

Variable	Percent Teach Part Time or Substitute N = 39	Percent Work in Related Technical Fields N = 26	Percent* Others N = 40
Age**			
20-24	31	11	14
25-34	51	62	56
35+	18	27	30
Ethnicity***			
White	100	96	84
Native American	0	4	8
Not Indicated	0	0	8
Gender**			
Women	67	46	48
Men	33	54	52
Extracurricular Responsibility			
Willing to Coach	44	8	44
Not Willing to Coach but Would Direct Other Activity	13	3	13
No Response	43	89	43

* This group includes people in other occupations or unemployed.
** Significant difference: p = .05.
*** No Blacks or Hispanics responded to the survey.

4. HOW EXTENSIVELY DID LOAN RECIPIENTS APPLY FOR TEACHING POSITIONS?

Respondents indicated the number of applications they placed in each of four geographic areas: Greater Seattle Metropolitan Area, Western Washington other than Seattle, Eastern Washington, and outside Washington state. Analysis of these data showed that no significant difference existed between men and women regarding the number of geographic areas where they applied for teaching positions. Most people expressed limited searches. People who took full-time positions looked, on the average, in two areas; all of the others applied, on the average, in 1.2 areas.

Summary

By the fall of 1987, the Incentive Loan Program for Mathematics and Science Teachers in Washington state had 253 students complete teacher preparation. About 50 percent found full-time teaching positions, but only 38 percent met the requirements for having their loans forgiven--that is, they teach mathematics and/or science at least half time in Washington state public secondary schools. Significantly more men are hired than women when compared to the proportions of men and women who prepared to teach these subjects. The majority of teaching positions involved teaching more than one subject. About one-third of the positions included coaching as an extracurricular assignment. Seventy-seven percent of the coaching/teaching combinations are held by men. This last fact helps explain the disproportionate hiring of men to teach mathematics and science.